U. of New Hampshire

VHF Absorption, Cosmic Ray and Geomagnetic Field Correlation, and Satellite Observations

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Second Semiannual Status Report

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I. For the riometer portion of the experimentation, troubles with the Western Electrodynamics Inc. Step-Frequency Riometer continued. At first engineers of W.E.I. provided possible clues for trouble shooting over the telephone. However, none of the suggested steps was productive enough to allow the instrument to be put into an operative condition. Finally, a technical representative was sent to the University of New Hampshire and he too was unable to repair the instrument to a level suitable for operation. He did feel, however, that the problem lay in the RF card of the riometer and ordered a replacement for the original. Once again this was not the basic cause of the trouble and after a few other attempts it was decided to return the instrument to the manufacturer for a complete overhaul.

The manufacturer made some corrections and claimed the instrument was ready to operate. It was returned to the University of New Hampshire, and we plugged it in to let it run over night in preparation for making our final checks. Entering the laboratory the following morning, we found the power supply card in large measure burned up. Several resistors and transistors

essentially evaporated during the course of the night. We called W. E. I. immediately and they had no explanation except for the obvious one of determining whether any wires were shorting somewhere within the instrument. We placed an order for the destroyed resistors and transistors and examined the instrument thoroughly for obvious shorts. None were apparent, and when the new resistors and transistors were installed, we again checked the instrument. This time, however, we did not run it over night, but stayed with the instrument smelling all the time. As soon as it was obvious that the resistors and transistors were about to go up in smoke, we shut the power down and checked all the wiring. No obvious shorts were apparent in the circuitry. We recalled W.E.I. and asked for suggestions as to the possible portion of the electronics which could cause an excessive power drain within the instrument. They had no suggestions, but promised to study the matter and call us the next day. No call was forthcoming and by this time our patience was exhausted with the instrument. We therefore began to undertake steps which would allow us to return it. By this time it was January and the legal steps necessary were not completed until very near the end of the report period.

In the meantime, an order was placed for a fixed frequency riometer from Aerospace Research, Inc. This instrument arrived at the end of the report period.

II. At the beginning of this report period S-66 (BE-B) had not been launched. Much work in renovation of the satellite detection

equipment had been done but no satisfactory skyborne signal was available to thoroughly test the instrumentation. Following the launch of BE-B, it became apparent that the Voltage Control Oscillator (VCO) was not as stable as desired. As a consequence time had to be taken from recording to partially redesign the VCO. Almost immediately after recordings were resumed building renovations, improperly undertaken, poured one night's rainfall on top of the instrumentation.

Due to the nature of the building renovation and the inadequacy of the construction firm performing the renovations, it became impossible to perform these experiments until the following March. At that time it was found that the water damage sustained in the original and subsequent drenchings had damaged the voltage control oscillator, the stable 1 Mc/s, the multiplying chains producing the injection frequency, and the voltage dividers. Repairs of the 1 Mc/oscillator and the Voltage Control Oscillator were effected soon after the moisture was cleared from the basement of the Physics building. However, much work on the voltage divider and frequency multiplying chains failed to produce satisfactory results. As a consequence, insurance claims were made and a new voltage divider and frequency multiplying chains were purchased at the end of the report period from these funds.